

What is claimed is:

1. A method of migrating a communication socket operating in conjunction with an application, the method comprising:

a) communicating over a network with a communication protocol
5 between a first active socket operating in a first layer of a first host device and a second active socket operating in the first layer of a second host device;

b) associating a first roam socket module operating in a second layer of the first host device with a second roam socket module operating in the second layer of the second host device via communication over the network between
10 the first active socket and the second active socket;

c) migrating the first roam socket module to a third host device; and

d) establishing communication between the third host device and the second host device with the first and second roam socket modules as a function of the association.
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2. The method of claim 1, wherein the first layer is transportation layer and the second layer is one of a session layer, a presentation layer and an application layer.

3. The method of claim 1, wherein b) comprises exchanging a host address and a port address of the first host device and the second host device.
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4. The method of claim 1, wherein d) comprises:
opening a third active socket with the first roam socket module and a
25 fourth active socket with the second roam socket module; and
communicating over the network between the first and second roam socket modules with the third and fourth active sockets.

5. The method of claim 1, wherein the communication protocol
30 comprises transport control protocol (TCP).

6. The method of claim 5, wherein c) comprises:
reading data from the first and second active sockets;

buffering data from the first active socket in a first synchronization buffer and data from the second active socket in a second synchronization buffer; and

migrating the first synchronization buffer to the third host device.

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7. The method of claim 6, further comprising e) reading the data from the first and second synchronization buffers before processing data from communication between the third host device and the second host device.

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8. The method of claim 1, wherein the communication protocol comprises user datagram protocol (UDP).

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9. The method of claim 8, wherein b) comprises creating an association table operable with the first roam socket module, the association table comprising a host address and a port address for the second host device.

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10. The method of claim 9, wherein c) comprises migrating the association table to the third host device.

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11. The method of claim 10, wherein d) comprises sending a re-association request message to the second host device as a function of the association table.

12. A method of migrating a communication socket of an application operating on a first host device, the communication socket forming one end of a connection between the first host device and a second host device, the method comprising:

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a) suspending the transfer of input/output data between an application and a migrateable socket operable with the application on the first host device;

b) buffering an input datastream received by the migrateable socket over the connection;

c) migrating the application, the buffered input datastream and the migrateable socket to a third host device;

d) reestablishing the connection between the second host device and the third host device as a function of the migrateable socket; and

e) providing the buffered input datastream to the application as a function of the migrateable socket.

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13. The method of claim 12, wherein the connection comprises a transmission control protocol (TCP) connection.

14. The method of claim 12, comprising the initial act of associating the migrateable socket with another migrateable socket operable with another application on the second host device.

15. The method of claim 14, wherein associating the migrateable socket with another migrateable socket comprises exchanging an object reference of each of the migrateable sockets via the connection, the object reference of each of the migrateable sockets comprising identifying information of the respective first and second host devices.

16. The method of claim 12, wherein a) comprises transmitting a close message to a migrateable socket operating on the second host device.

17. The method of claim 16, wherein the migrateable socket of the second host device performs a) and b).

18. The method of claim 12, wherein the migrateable socket comprises a roam socket module and an active socket and c) comprises closing the active socket prior to migration.

19. The method of claim 12, wherein the migrateable socket comprises a roam socket module and an active socket and c) comprises:

encoding the buffered input datastream and an execution state of the roam socket module; and

transmitting the encoded buffered input datastream and the execution state to the third host device.

20. The method of claim 12, wherein d) comprises:
- 5 opening a server socket on the third host device with the migrateable socket;
- initiating handshaking between the second host device and the third host device; and
- opening an active socket on the second host device and the third host device during handshaking.
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21. A method of migrating a communication socket of an application, the communication socket and application operable on a host device to communicate with
- 15 other host devices over a network, the method comprising:

- a) communicating between a plurality of host devices with a communication protocol, each host device comprising an application, a migrateable socket and an association table;
- b) storing identifying information exchanged between the host devices
- 20 in each respective association table to form an association link;
- c) migrating a first application, a first migrateable socket and a first association table from a first host device to a second host device;
- d) sending a re-association message from the second host device to a host device identified in the first association table as a function of the first
- 25 migrateable socket; and
- e) receiving a re-association acknowledgment message from the identified host device with the first migrateable socket.

22. The method of claim 21, wherein the communication protocol
- 30 comprises a user datagram protocol (UDP).

23. The method of claim 21, wherein the identifying information comprises a host address and a port address.

24. The method of claim 21, wherein d) comprises:
opening an active socket with the first migrateable socket; and
sending the re-association message via the active socket with the
5 communication protocol.

25. The method of claim 21, wherein d) comprises including a host address
and a port address for the second host device in the re-association message.

10 26. The method of claim 21, wherein d) comprises:
receiving the re-association message with a migrateable socket
operable in the identified host device;
updating an association table in the identified host device as a function
of the re-association message; and
15 sending the re-association acknowledgement message with the
migrateable socket in the identified host device.

27. The method of claim 26, further comprising updating an address
translation table in the identified host device to reflect migration from the first host
20 device to the second host device, wherein the address translation table redirects
communication addressed to the first host device to the second host device.

28. The method of claim 21, wherein d) comprises resending the re-
association message when data packets are received from the identified host device
25 prior to the re-association acknowledgement message.

29. A socket migration architecture for migrating a communication socket
of an application, the communication socket for communication between a first host
device and a second host device over a network, the socket migration architecture
30 comprising:

a migrateable socket operable on the first host device, wherein the
migrateable socket is operable to form one end of a connection between the
first and second host devices; and

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a synchronization buffer operable with the migrateable socket on the first host device, the synchronization buffer operable to store an input datastream provided by the second host device during a migration event, the synchronization buffer and the migrateable socket operable to migrate from the first host device to a third host device, the migrateable socket operable on the third host device to reestablish the connection between the second and third host devices, the migrateable socket operable to extract the stored input datastream from the synchronization buffer once the connection is reestablished.

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30 The socket migration architecture of claim 29, wherein the connection is a transfer control protocol (TCP) connection.

31. The socket migration architecture of claim 29, wherein the migrateable socket comprises a roam socket module and an active socket.

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32. The socket migration architecture of claim 31, wherein the migrateable socket is operable to close the active socket prior to migration.

33. The socket migration architecture of claim 32, wherein the migrateable socket is operable to open an active socket to reestablish the connection.

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34. The socket migration architecture of claim 29, wherein the input datastream comprises data flushed from the second host device.

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35. The socket migration architecture of claim 29, further comprising a migrateable socket and a synchronization buffer operable on the second host device, the migrateable socket operable on the second host device to form a second end of the connection, the synchronization buffer operable on the second host device to store an input datastream provided from the first host device during a migration event.

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36. The socket migration architecture of claim 29, wherein the synchronization buffer is operable to store the input datastream when input/output data of the application operable with the migrateable socket on the first host device is frozen in preparation for migration.

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37. The socket migration architecture of claim 29, wherein the migrateable socket is operable to form an association link with the second host device.

10 38. A socket migration architecture for migrating a communication socket of an application, the communication socket and application operable on a host device to communicate with other host devices over a network, the socket migration architecture comprising:

15 a migrateable socket operable in a first host device to communicate with at least one other host device with a communication protocol; and
an association table operable in the first host device to store identifying information provided with the communication protocol from the at least one other host device,

20 the migrateable socket and the association table migrateable from the first host device to a second host device,

the migrateable socket operable in the second host device to send a re-association message with the communication protocol to the at least one other host device as a function of the identifying information,

25 the migrateable socket operable to receive a re-association acknowledgement message with the communication protocol from the at least one other host device.

39. The socket migration architecture of claim 38, wherein the communication protocol comprises a user datagram protocol (UDP).

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40. The socket migration architecture of claim 38, wherein the migrateable socket comprises a roam socket module and an active socket.

41. The socket migration architecture of claim 38, wherein the re-association message comprises a host address and a port address of the second host device.

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42. The socket migration architecture of claim 38, wherein the at least one other host device comprises a migrateable socket, an association table and an address translation table.

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43. The socket migration architecture of claim 42, wherein the address translation table is operable to store a cross-reference between identifying information of the first host device and the second host device when the re-association message is received.